

THE FIRST RECORD OF THE FAMILY DOUGLASIIDAE (LEPIDOPTERA) FROM TASMANIA

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Abstract

The family Douglassiidae is recorded from Tasmania for the first time. The single specimen is the fifth known from Australia and is identified as *Tinagma leucanthes* Meyrick, 1897. The Douglassiidae, both in Australia and overseas, are briefly discussed.

Introduction

The family Douglassiidae is often placed in the large and cosmopolitan superfamily Tineoidea (Common 1990), which includes the families Psychidae, Tineidae and the Gracillariidae or in the Gracillarioidea (Nielsen 1996). Members of Douglassiidae are easily recognized by the very small size of the adults, the much reduced venation, prominent ocellus, naked proboscis, drooping labial palpi, the smooth-scaled head, lack of an eye-cap and abdominal sternites of the tineoid type.

There are approximately 20 species of the family known from the Palaearctic Region in two genera, *Tinagma* Zeller, 1839 and *Klimeschia* Amsel, 1938 (Gaedike 1974, 1991, Budashkin 2003) and about eight species from the Nearctic, all in *Tinagma* (Gaedike 1990, Harrison 2005). The genus *Protonyctia*, known from Ecuador with the type species *P. originalis* Meyrick, 1932, has been variously placed in the Douglassiidae or the Bucculatricidae. No other species are known besides *Tinagma leucanthes* Meyrick, 1897 from Australia. Currently the world fauna is therefore about 29 species as the Nearctic and Palaearctic have no species in common. Various papers and websites give conflicting information on the number of species and which genera are included in the Douglassiidae, but Davis & Robinson (1999) in the most comprehensive treatment of the family include only the genera *Tinagma* and *Klimeschia*.

No biological information is available from Australia but in Europe Douglassiidae larvae are known to be miners and borers in leaves, petioles or stems of Boraginaceae (*Echium*, *Anchusa*), Rosaceae (*Dryas*, *Fragaria*, *Rubus* and *Potentilla*) and Lamiaceae (*Thymus*). Some species fly at dusk, some in sunlight and some visit flowers. Agassiz (1985) says that the British species rest with the anterior part of the body raised.

Observations

On 16 January 2006 in still and warm weather conditions, one of us (AK) netted a small moth with a wingspan of 5 mm near Bicheno, Tasmania. It was flying just around sunset in coastal heath and sedgeland close to the coast. It has since proved to be a member of the family Douglassiidae, which



Figs 1-3. *T. leucanthes*, male, Bicheno, Tasmania (ANIC): (1) Upperside. (2) Underside. (3) Genitalia, ventral view. a. uncus, b. sacculus, c. valva, d. saccus, e. juxta, f. phallus.

has not been previously recorded in Tasmania. The specimen was conspicuous due to its unusual behaviour and resting posture. It was actively flying, but occasionally rested on sedge leaves. When sitting, it kept the wings in a raised position and frequently moved them up and down. This was reminiscent of the behaviour of some *Choreutis* (Choreutidae) and *Glyphipterix* (Glyphipterigidae) species. The specimen is labelled "Australia, Tasmania, Bicheno, coastal heath/sedge, dusk, leg. A & H Kallies" and has been kindly donated to the Australian National Insect Collection (ANIC), CSIRO, Canberra. The specimen (Figs 1, 2) is a male and in wing pattern and other features closely resembles *Tinagma leucanthes* from Sydney, New South Wales. The ventral surface of the second segment of the labial palpi bears rough scales banded in black and white, the forewing is black with a white median transverse band and a white spot on the costa short of the apex and a smaller corresponding spot near the tornus. The hindwing is black. The upperside of the hindwing looks patterned in the illustration but this is due to scale loss rather than a colour pattern as on the underside of the hind wing. On the underside both forewing and hindwing are black with white banding more extensive than on the upperside. The abdomen is grey with a white tip, with broad reflective scales at the base and on the segmental margins.

Taxonomic Note

The specimen from Bicheno was dissected by one of us (AK) and the genitalia (Fig. 3) were found to correspond to those illustrated by Common (1990). Thus, we currently consider all known Australian douglasiid specimens to belong to a single species, *T. leucanthes*. Male and female genitalia of Palaearctic *Tinagma* and *Klimeschia* were illustrated by Gaedike (1974, 1991) and Budashkin (2003). While the structures of the male genitalia of *Klimeschia* differ fundamentally from those of *Tinagma*, there are also considerable differences between the Palaearctic *Tinagma* species and the Australian *T. leucanthes*. In *T. leucanthes* the valva shows a very strong basal projection (sacculus) but is otherwise simple with hair-like setae evenly distributed in the distal half. The valvae of Palaearctic *Tinagma* species such as *T. peridecellum* Zeller 1839, the type species of the genus, however, show a less developed sacculus, a conspicuous apical process, a strongly sclerotized ventral margin and the setae appear to be concentrated along the dorsal margin of the valva. In *T. leucanthes* the juxta is very prominent, almost as long as the valva and covered with hair-like setae; in *T. peridecellum*, however, the juxta appears to be relatively small and to lack setae. Furthermore, the aedeagus (phallus) of *T. leucanthes* is only somewhat longer than the valva; that of *T. peridecellum* is about twice as long as the valva. Taken together these differences would suggest that *T. leucanthes* represents a genus different from *Tinagma*; however, lacking knowledge of the female genitalia and sufficient material of typical Palaearctic *Tinagma* species we refrain from the erection of a new genus at this stage.

Discussion

Douglasiidae are known from very few specimens in Australia. *Tinagma leucanthes*, the only described species, is represented by three syntypes labelled as collected at Sydney by Edward Meyrick on 6 April 1879 and now in the Natural History Museum, London. Meyrick, in his unpublished "diary of captures" (p. 71), records that on 6 April 1879 he collected in Waverley Gully, and that it was hot and sunny with a light SE wind. He collected in the daytime and at light at night. Waverley is now a suburb of east Sydney and has long been cleared for housing. Meyrick did not mention the *T. leucanthes* specimens in his diary, possibly because he was unsure what they were, but they must have come from the general Waverley area. Meyrick collected both sexes and stated that the female differed from the male in that the white spots on the forewing near the apex and tornus were more extensive and there were further white spots and marks in the apical area. The only other specimen in the Douglasiidae known from Australia is a female, identified as *T. leucanthes*, collected by A. Jefferis Turner on [North] Stradbroke Island, Queensland, on 30 November 1902 and now in the ANIC. The Bicheno specimen is larger than the Stradbroke Island specimen but appears to belong to the same species (see above).

Meyrick (1897) described *T. leucanthes* in the family Elachistidae where he (Meyrick 1895) had placed the genus *Tinagma*, possibly on the basis of the reduced venation. This was followed by subsequent authors including Dyar et al. (1902) and Braun (1921) but the genus has none of the characters now used to define the Elachistidae. It was also sometimes placed in the Glyphipterigidae, for example by Staudinger and Rebel (1901), possibly because of the smooth-scaled head, prominent ocellus and naked proboscis. Its odd nature was recognized by Forbes (1923) who used the name Douglasiidae, which was then accepted by Meyrick (1928), Fletcher (1929) and all modern authors. The Douglasiidae differ from the Glyphipterigidae by the reduced venation and the abdominal sternites of the tineoid type. The family has been placed in various superfamilies; the Yponomeutoidea (Common 1970, Heppner & Duckworth 1983) and, after Kyrki (1984) showed it had abdominal sternites of the tineoid type, in the Tineoidea (Common 1990, Nielsen & Common 1991) or the Gracillarioidea (Scoble 1992, Nielsen 1996, Davis & Robinson 1999).

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